FORM PTO-1390 (Modified)
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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

RCA88853

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

09/582451

INTERNATIONAL APPLICATION NO. **PCT/US99/00315**	INTERNATIONAL FILING DATE **07 JANUARY 1999**	PRIORITY DATE CLAIMED **07 JANUARY 1998**

TITLE OF INVENTION
APPARATUS FOR PROVIDING A VIDEO LIP SYNC DELAY AND METHOD THEREFORE

APPLICANT(S) FOR DO/EO/US
MICHAEL SCOTT DEISS AND MARK ROBERT ANDERSON

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.

2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.

3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).

4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.

5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))

    a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).

    b. ☒ has been transmitted by the International Bureau.

    c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).

6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).

7. ☐ A copy of the International Search Report (PCT/ISA/210).

8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))

    a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).

    b. ☐ have been transmitted by the International Bureau.

    c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.

    d. ☒ have not been made and will not be made.

9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).

10. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).

11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).

12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.

14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.

15. ☒ A **FIRST** preliminary amendment.

16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.

17. ☐ A substitute specification.

18. ☐ A change of power of attorney and/or address letter.

19. ☒ Certificate of Mailing by Express Mail

20. ☒ Other items or information:

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532 Rec'd PCT/PTO 26 JUN 2000
RCA88853

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Michael Scott Deiss et al.

Int'l. Appl. No. : PCT/US99/00315

Int'l. Filing No : 07 January 1999 (07.01.99)

For : APPARATUS FOR PROVIDING A VIDEO LIP SYNC DELAY AND METHOD THEREFORE

PRELIMINARY AMENDMENT

Honorable Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

In the US national phase application of PCT/US99/00315 filed herewith, please enter the following amendments:

In the Claims

In Claim 1, line 2, delete [(1500, 1501)],

 line 5, delete [(1500)],

 line 6, delete [(1507, 1509)],

 line 8, delete [(1540, 1550, 1560)],

 line 10, delete [(1511)],

 line 14, delete [(1613)],

 line 18, delete [(1605, 1607)],

 line 21, delete [(1519, 1523, 1525, 1529)],

In Claim 2, line 1, delete [(1605],

 line 2, delete [1607)].

In Claim 3, line 1, delete [(1605,]

 line 2, delete [1607)] and [(1613)].

In Claim 4, line 1, delete [(1605,]

 line 2, delete [1607)] and [(1507, 1509)].

In Claim 5,   line 1, delete [or Claim 4],
               ine 2, delete [(1613)] and [(1609)].

In Claim 6,   line 2, delete [(1609)].

In Claim 7,   line 1, delete [or Claim 7],
               line 2, delete [(1511)].

In Claim 10,   line 2, delete [(1609)].

REMARKS

The above claims have been amended to remove reference indicia.
No new matter has been added.

No fee is believed to been incurred by virtue of this amendment.
However, if a fee is incurred on the basis of this amendment, please charge such fee
against deposit account 07-0832.

Respectfully Submitted,
Michael Scott Deiss et al.

By: _____
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26 June 2000

2/PRTS

EXP M/H R2533622295%

WO 99/35824

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PCT/US99/00315

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APPARATUS FOR PROVIDING A VIDEO LIP SYNC DELAY AND METHOD THEREFORE

Field of the Invention

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The invention concerns an apparatus for providing a delay of a standard definition television ("SDTV") (e.g., NTSC, PAL or SECAM) audio signal to maintain proper synchronization of the video image and the audio output. The invention is especially well suited for use

10   in a high definition television ("HDTV") system.

Background of the Invention

15   Typical consumer electronic products, such as televisions and VCRs are known to be configured to receive standard definition signals (such as NTSC, PAL or SECAM). However, it is recognized that the emerging digital consumer electronic products must be configured to receive both digital streams and standard definition signals. Digital

20   receivers are designed to receive television information in the form of a stream of digital packets representing video and audio information in compressed form in accordance with a predetermined digital compression standard. For example, the MPEG video and audio compression standards may be employed. The MPEG video and audio

25   compression standards are international standards for the coded representation of and audio information developed by the Motion Pictures Expert Group.

Summary of the Invention

30

The present invention resides in part in the recognition that a high definition digital receiver (e.g., HDTV) configured to receive SDTV signals is subject to displaying a video image that is not in synchronization with the audible output and in part with the

35   apparatus to maintain synchronization.

In accordance with one aspect of the present invention, a receiver apparatus comprises means for receiving a packetized input data

stream; means for receiving a digitized audio signal and a digitized video signal; and means for partitioning said packetized data stream to generate a video component and an audio component. Further, the apparatus comprises a first and second means for digital signal

5   processing to generate, respectively, a decompressed video output signal in response to one of said video component of said packetized data stream and said digitized video signal and a decompressed audio output signal in response to one of said audio component of said packetized data stream and said digitized audio signal. Still further,

10   the apparatus comprises a means for transposing said video output signal to a displayable video signal and said audio output signal to an audible output signal.

In accordance with another aspect of the present invention, the

15   receiver apparatus further comprises an adjustable means for delaying said output audio signal to be in synchronism with said displayable video signal.

In accordance with yet another aspect of the present invention, the

20   adjustable delaying means comprises an adjustable memory device and may be connected to one of the second processing means or the partitioning means. The second processing means further comprises means for secondary audio processing., such as surround sound processing.

25

In accordance with a method aspect of the present invention, there is provided a method for processing an input signal comprising; receiving one of a packetized input data stream and a digitized signal comprised of a digitized video signal and a digitized audio signal;

30   partitioning one of said packetized data stream to generate a video component and an audio component; converting said digitized video signal into a progressive scan format; processing one of said packetized data stream and said digitized input signal to generate a decompressed video and audio output signal; and transposing said

35   video output signal to a displayable video signal and said audio output signal to an audible output signal.

In accordance with another method aspect of the present invention, the method for processing an input signal further comprises delaying said audio output signal to be in synchronism with said displayable video signal. The step of delaying comprises providing said audio

5   output signal to an adjustable memory device or to a secondary processor.

These and other aspects of the invention will be described with respect to the accompanying Drawings.

10

Brief Description of the Drawing

Figure 1 is a simplified schematic block diagram of a digital receiver including apparatus constructed in accordance with

15   an exemplary embodiment of the present invention; and

Figure 2 is a simplified schematic block diagram of the audio MPEG/AC-3 decoder of Figure 1.

20

Detailed Description of the Drawing

Digital receiver 15 tunes, demodulates and otherwise processes the received television signal as will be described in detail below to produce displayable video images on a conventional display device

25   and audible signals on conventional speakers in response to received television information.

The apparatus shown in Figure 1 is a digital receiver 15, such as, for example, one that may be employed in a high definition television

30   ("HDTV"). Particularly, the television information is received in either (1) compressed form in accordance with a predetermined digital compression standard (for example, the MPEG video and audio compression standards) or (2) SDTV analog signal (for example, NTSC, PAL or SECAM). The MPEG video and audio compression standards

35   are international standards for the coded representation of and audio information developed by the Motion Pictures Expert Group.

The digital video and audio signals are compressed and encoded according to the MPEG video and audio compression and encoding standards to form respective series or streams of data packets. The video and audio packets are multiplexed to form a stream of packets

5   for transmission. Each packet of the transmission stream includes   a data or "payload" portion and a header portion which identifies the type of information represented by the payload portion of the packet. Packets corresponding to control and other data may also be added the transmission stream.

10

Forward error correction (FEC) data is added to the packets in order make the correction of errors due to noise within the transmission path possible. The well known Viterbi and Reed-Solomon types of forward error correction coding may both be advantageously

15   employed. The digital information resulting from the compression, encoding and error correction operations is modulated on a carrier in what is known in the digital transmission field as QPSK (Quadrature Phase Shift Keying) modulation.

20   Digital receiver 15 includes both a HD/NTSC tuner 1500 and a DSS tuner 1501, both having a local oscillator and mixer (not shown) for selecting the appropriate carrier signal form the plurality of received signals and for converting the frequency of the selected carrier to a lower frequency to produce an intermediate frequency (IF) signal.

25   Further HD/NTSC tuner 1500 and DSS tuner 1501 demodulate the IF signal.

DSS tuner 1501 may include a QPSK demodulator, not shown, to produce a demodulated digital signal and a FEC decoder, not shown, to

30   decode the error correction data contained in the demodulated digital signal, and based on the error correction data corrects the demodulated packets representing video, audio and other information to produce a stream of error corrected data packets which are provided to link circuitry 1505. The SDTV demodulated signal from

35   HD/NTSC tuner 1500 is further processed in a conventional manner by NTSC processing circuitry 1540. (The details of NTSC processing circuitry 1540 are not required to fully understand the present

invention.)   Whereas, the HD demodulated stream is provided the link circuitry 1505.

5   A MPEG transport decoder unit 1507 cooperates with a buffer memory in the form of a random access memory (RAM) 1509 to route the payload portion of the video packets of the error corrected stream to a video MPEG decoder 1511 and the payload portion of the audio packets to an audio MPEG/AC-3 decoder 1513 via a data bus or separate lines according to the header information contained in the

10   packets.   RAM 1509 is used to temporarily store packets of the data stream of the transmitted signal in respective memory locations in accordance with the type of information which they represent. Transport unit 1507 is a memory manager for buffer RAM 1509 which demultiplexes the data packets of the error corrected stream

15   and routes the payload portions of the packets to respective memory locations according to the header portions of the respective packets. The contents of the video and audio sections of RAM 1509 are read out and transferred to video MPEG decoder 1511 and audio MPEG/AC-3 decoder 1513, respectively, on demand in response to

20   requests from these units.   Details of the construction of transport 1507 and buffer RAM 1509 are not required to understand the present invention, but may be found in US patent application serial number 232,789, entitled "A Packet Video Signal Inverse Transport System" filed for M. S. Deiss on April 22, 1994.

25
Video MPEG decoder 1511 interfaces with a dynamic random access memory (DRAM) 1515 to decode and decompress the payload portion of the video packets to form a stream or sequence of digital words representing video information in component form.   For example, the

30   components may correspond to a luminance (Y) component and two color difference (Cr and Cb) components.   Further, video MPEG decoder 1511 has a separate input to receive a digitized SDTV video signal from analog-to-digital converter ("A/D") 1550.   (Details of the construction of video MPEG decoder is not required to understand the

35   present invention.)   Video decoding and decompression integrated circuits (ICs) are commercially available.   For example, a MPEG decoding and decompression IC, identified by part number ST3240, is available from SGS Thomson, of France.

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The luminance and chrominance representative digital words are converted to analog luminance and chrominance signals by respective sections of a digital-to-analog converter (DAC) 1519.

5   These analog luminance and chrominance signals are coupled to "2H" video processing circuitry 1529 which converts the component representative digital words to three separate video signals; R, G and B. These video signals are provided to a display device 1531. (Details of the construction of the well known "2H" video processing circuitry

10   and display device are not required to understand the present invention.)

Audio MPEG/AC-3 decoder 1513 interfaces with dynamic random access memory (DRAM) 1521 to decode and decompress the payload

15   portion of the audio packets to produce a sequences of digital words representing "left" (L) and "right" (R) audio information. As is well known in the art, memory 1521 may optionally be integral with audio MPEG/AC-3 decoder 1513. Further, decoder 1513 has a separate input to receive a digitized standard definition audio signal

20   (explained in detail below in connection with Figure 2a). Audio decoding and decompression ICs are commercially available. For example, a MPEG audio decoding and decompression IC, identified by part number DSP56011, is available from Motorola. The sequences of audio representative digital words are converted to baseband analog

25   left and right audio signals by respective sections of DAC 1523 and audio processing circuitry 1525. Although only two audio channels are shown in the Figure, it will be appreciated that in practice, one or more additional audio channels, for example, for "surround sound" reproduction, may be provided.

30

The baseband analog video and audio signals are coupled to speakers 1527, which may be integral with display device 1531 via respective baseband connections. The baseband analog video and audio signals may also be coupled to a modulator (not shown) which modulates the

35   analog signals on to a radio frequency (RF) carrier in accordance with a conventional television standard such as NTSC, PAL or SECAM for coupling to the antenna input of a display device without baseband inputs.

A microprocessor 1527 provides frequency selection control data to HD/NTSC tuner 1500 and DSS tuner 1501 for controlling the operation of the tuner to tune channels selected by the user. Microprocessor 1527 also operates interactively with transport 1507 to affect the routing of payload portions of packets. Microprocessor 1527 additionally provides control data to video MPEG decoder 1511 and audio decoder 1513 via a control bus. Microprocessor 1527 operates in response to a control program stored in a "read only" memory (ROM) 1529.

Both video MPEG decoder 1515 and audio MPEG/AC-3 decoder 1513 are configured to receive the digitized video and audio components, respectively, of a SDTV analog input signal. Digitized video and audio components are provided by passing the demodulated and processed analog video and audio components generated by NTSC processing circuitry through analog-to-digital converters 1550 and 1560, respectively. In operation, the digitized video component is processed by the video MPEG decoder and up-converter 1511 and the digitized audio component is processed by audio MPEG/AC-3 decoder 1513. The time to process the digitized video component is greater than the time necessary to process the digitized audio component thereby creating a delay between audio output and the display image.

The apparatus shown in Figure 2 is a simplified schematic block diagram of the audio MPEG/AC-3 decoder 1513 discussed above. As described above, decoder 1513 generates digital words which represent the audio information in response to either a digitized SDTV audio signal produced by A/D 1560 or the audio portion of the input stream produced by MPEG transport decoder unit 1507 and RAM 1509. The details of audio MPEG/AC-3 decoder 1513 will be discussed in terms of it functional operation and signal flow path. The audio portion of the input MPEG stream is supplied to decoder 1513 through parallel input/output 1603. The input stream is provided to FIFO memory means 1601 for initial processing and formatting. Audio MPEG/AC-3 Processing circuitry 1613 processes the input stream to produce sequences of digital words representing the audio information. Additional audio processing, such as surround

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sound processing, may be performed by subsequent audio processing means 1609 to produce further processed audio information. A control signal (not shown) is provided multiplexer ("MUX") 1611 to select between the audio information generated by processing and

5   control circuitry 1613 and the further processed audio information generated by subsequent audio processing means 1609.

Audio MPEG/AC-3 decoder 1513 is configured to generate audio information in response to a digitized SDTV audio input signal

10   received from A/D 1560 as described above. FIFO memory means 1601 formats the digitized audio input signal prior to it being provided to pulse code modulated circuitry 1605. As discussed above, the time to process the digitized SDTV audio input signal is less than the time necessary to process the corresponding digitized video

15   signal thereby necessitating the insertion of a delay in the audio processing to maintain synchronization between these two signals. The PCM processed audio input signal is provided to delay means 1607. Delay means 1607 may be a portion of the general memory 1521 associated with the audio MPEG/AC-3 decoder 1513. The

20   delayed audio input signal is provided to the control portion of audio MPEG/AC-3 processing circuitry 1613 and may either be supplied directly to MUX 1611 or to subsequent audio processing means 1609 as described above prior to being supplied to D/A 1523.

25   Alternately, the PCM processed audio signal may be provided to transport unit 1507 and RAM 1509 through parallel I/O 1603 for delay processing. Specifically, RAM 1509 will be used to achieve the delay accomplished by delay means 1607 as described above.

30   While the present invention has been described in terms of a specific embodiment, it will be appreciated that modifications may be made. These and other modifications are contemplated to be within the scope of the invention defined by the following claims.

CLAIMS

5   1.   A receiver comprising:
(a)   means for receiving a packetized input data stream comprised of multiplexed and compressed packets, each of said packets having at least header and payload data;
(b)   means for receiving a digitized audio signal and a digitized
10   video signal;
(c)   means for partitioning said packetized data stream to generate a video component and an audio component;
(d)   first means for digital signal processing to generate a decompressed video output signal in response to one of said video
15   component of said packetized data stream and said digitized video signal;
(e)   second means for digital signal processing to generate a decompressed audio output signal in response to one of said audio component of said packetized data stream and said digitized audio
20   signal; and
(f)   means for transposing said video output signal to a displayable video signal and said audio output signal to an audible output signal.

25   2.   The receiver of claim 1 further comprising an adjustable means for delaying said output audio signal to be in synchronism with said displayable video signal.

3.   The receiver of claim 2 wherein said adjustable delaying means
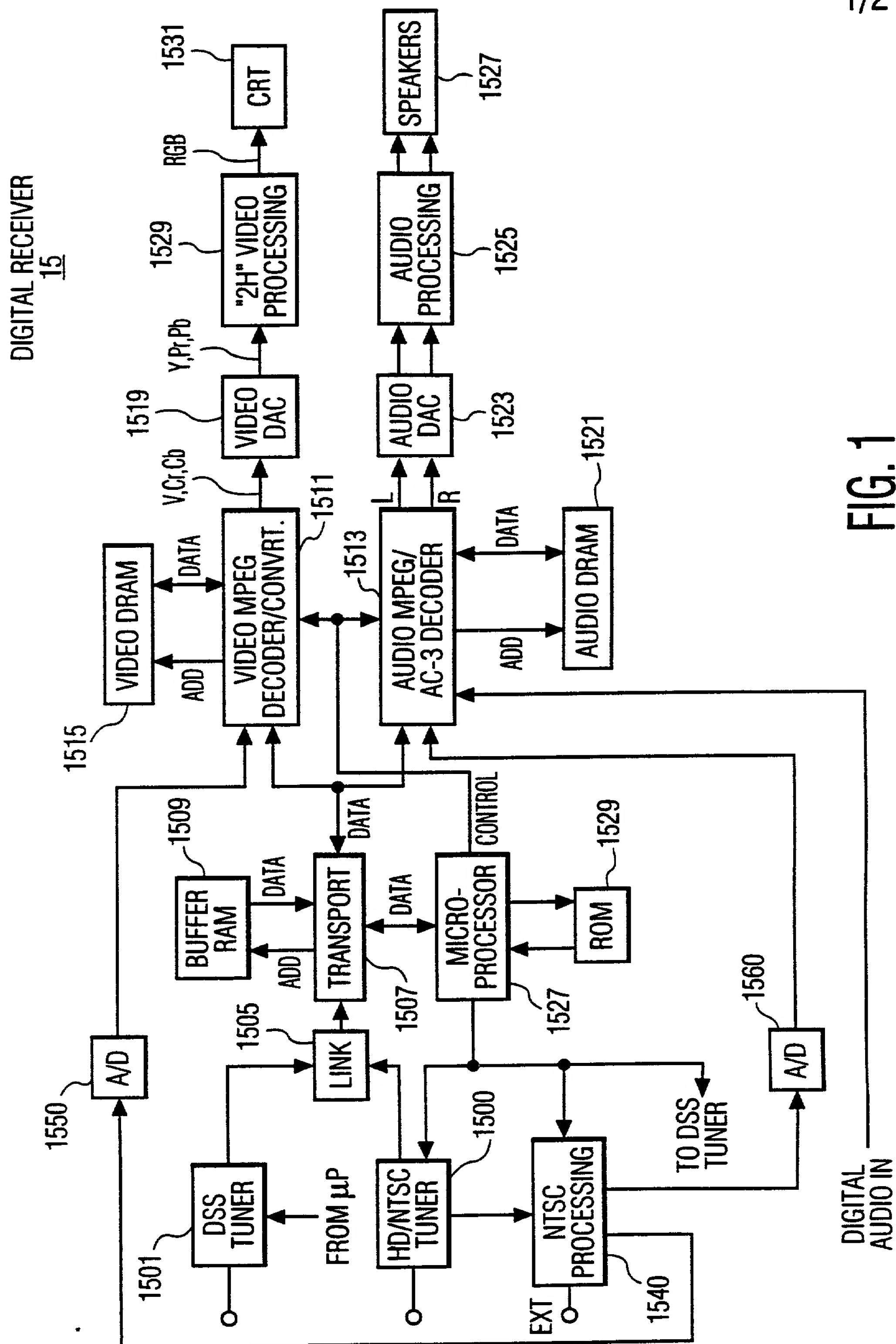30   comprises an adjustable memory device.

4.   The receiver of claim 3 wherein said delaying means is connected to said second processing means.

35   5.   The receiver of claim 3 wherein said delaying means is connected to said partitioning means.

6.   The receiver of claim 4 or claim 5 wherein said second processing means further comprises means for secondary audio processing.

5   7.   The receiver of claim 6 wherein said secondary audio processing means comprises means for surround sound processing.

8.   The receiver of claim 1 or claim 7 wherein said first processing means comprises a means for converting said digitized video signal

10   having an interlace video format into a digitized video signal having a progressive scan format.

9.   A method for processing an input signal having a video component and an audio component, said method comprising:

15   (a)   receiving one of a packetized input data stream and a digitized signal comprised of a digitized video signal and a digitized audio signal;

             (b)   partitioning one of said packetized data stream to generate a video component and an audio component;

20   (c)   converting said digitized video signal into a progressive scan format;

             (d)   processing one of said video component of said packetized data stream and said digitized video signal to generate a decompressed video output signal;

25   (e)   processing one of said audio component of said packetized data stream and said digitized audio signal to generate a decompressed audio output signal,

             (f)   transposing said video output signal to a displayable video signal and said audio output signal to an audible output signal.

30

10.   The method of claim 9 further comprising delaying said audio output signal to be in synchronism with said displayable video signal.

11.   The method of claim 10 wherein the step of delaying comprises

35   providing said audio output signal to an adjustable memory device.

12.   The method of claim 11 further comprising the step of providing said audio output signal to a secondary processor.

11

Abstract of the Disclosure

5   A digital receiver for processing one of a packetized input data stream and a digitized standard definition input signal is provides a delay in the processing of the standard definition audio input signal to maintain synchronism with the processing of a corresponding standard definition video signal.

10

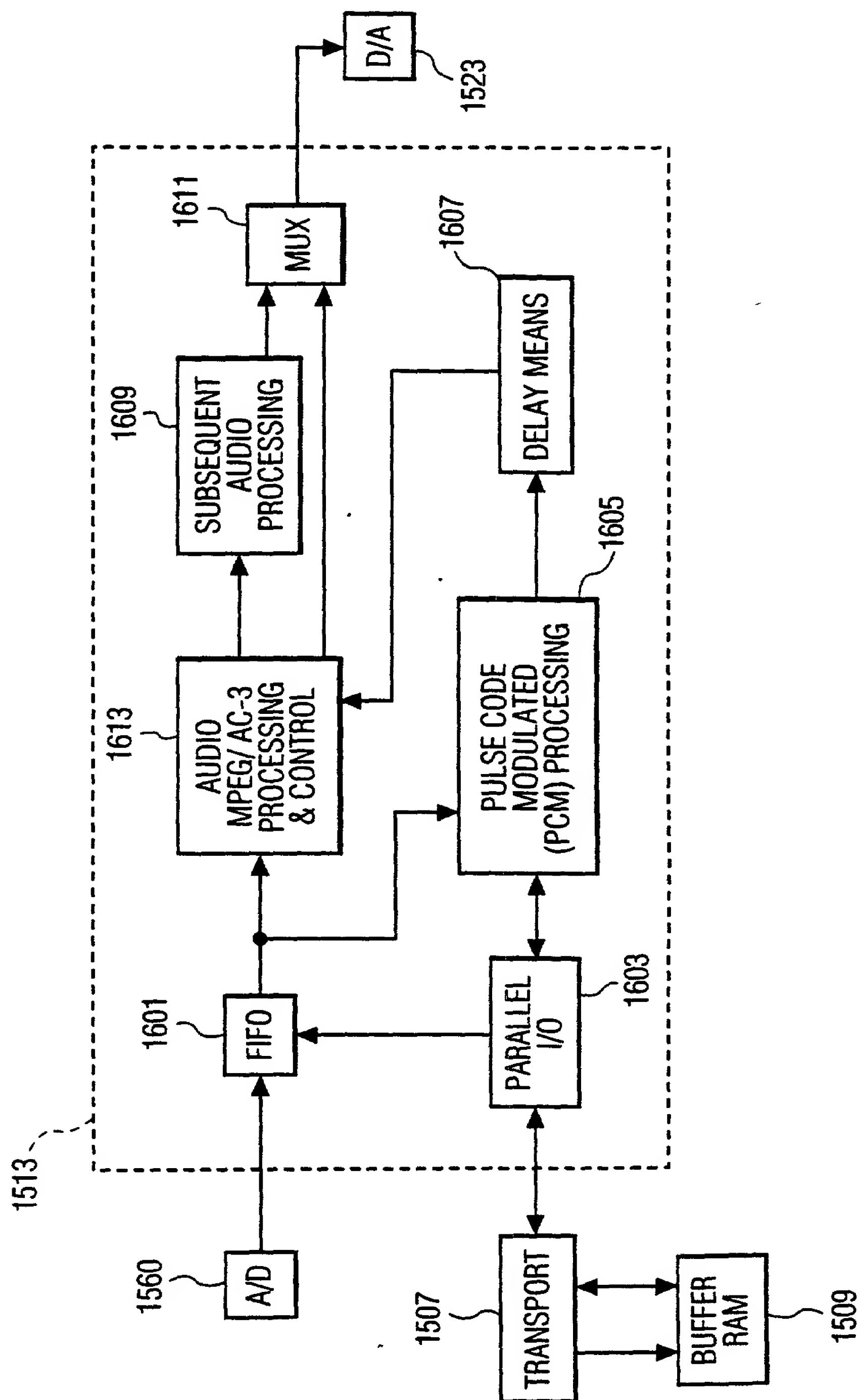FIG. 1

2/2

FIG. 2

PTO/SB/01 (12-97)
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Patent and Trademark Office; U S. DEPARTMENT OF COMMERCE
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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)	Attorney Docket Number	RCA 88853
	First Named Inventor	Michael Scott Deiss

	COMPLETE IF KNOWN	
☐ Declaration Submitted with Initial Filing OR ☒ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)	Application Number	
	Filing Date	
	Group Art Unit	
	Examiner Name	

As a below named Inventor, I hereby declare

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

APPARATUS FOR PROVIDING A VIDEO LIP SYNC DELAY AND METHOD THEREFORE

the specification of which

☐ is attached hereto
OR
☒ was filed on (MM/DD/YYYY) January 7, 1999 as United States Application Number or PCT International

Application Number PCT/US99/00315 and was amended on (MM/DD/YYYY) May 5, 2000 (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)	
60/070,640	January 7, 1998	☐ Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

[Page 1 of 2]

Burden Hour Statement: This form is estimated to take 0.4 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO:

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DECLARATION — Utility or Design Patent Application

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U. S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)
PCT/US99/00315	January 7, 1999	

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: ☐ Customer Number OR ☒ Registered practitioner(s) name/registration number listed below ➡ *Place Customer Number Bar Code Label here*

Name	Registration Number	Name	Registration Number
JOSEPH S. TRIPOLI	26,040		
JOSPEH J. LAKS	27,914		
DAVID T. SHONEMAN	39,371		

☐ Additional registered practitioner(s) named on supplemental Registered Practitioner Information sheet PTO/SB/02C attached hereto.

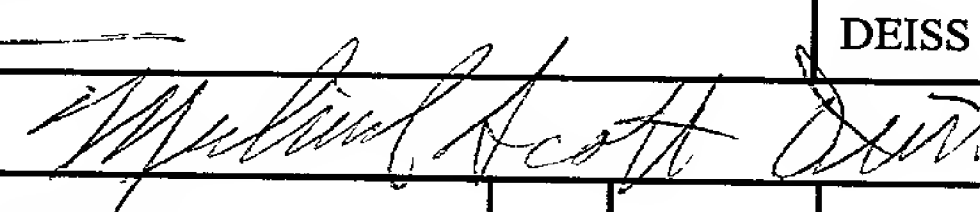Direct all correspondence to: ☐ Customer Number or Bar Code Label [ ] OR ☒ Correspondence address below

Name	Joseph S. Tripoli - Patent Operations
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Address	PO Box 5312

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Country	US	Telephone	609-734-9875		Fax	609-734-9700

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor:	☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname
MICHAEL SCOTT	DEISS

Inventor's Signature	*[signature]*	Date	OCT 11 2000
Residence: City	Zionsville	State	IN	Country	US	Citizenship	US

Post Office Address	1103 Indian Pipe Lane
Post Office Address	Zionsville, Indiana 46077 US

City		State		ZIP		Country	

☒ Additional inventors are being named on the ___1___ supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto

Please type a plus sign (+) inside this box ➜ ☐ +

PTO/SB/02A (3-97)
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DECLARATION	ADDITIONAL INVENTOR(S) Supplemental Sheet Page 1 of 1

Name of Additional Joint Inventor, if any: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname
MARK ROBERT	ANDERSON

Inventor's Signature	*Mark Robert Anderson*			Date	OCT. 11 2000

Residence: City	Indianapolis	State	IN	Country	US	Citizenship	US

Post Office Address	8511 Westridge Drive

Post Office Address	Indianapolis, Indiana 46234 US

City		State		ZIP		Country	

Name of Additional Joint Inventor, if any: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname

Inventor's Signature				Date	

Residence: City		State		Country		Citizenship	

Post Office Address	

Post Office Address	

City		State		ZIP		Country	

Name of Additional Joint Inventor, if any: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname

Inventor's Signature				Date	

Residence: City		State		Country		Citizenship	

Post Office Address	

Post Office Address	

City		State		ZIP		Country	

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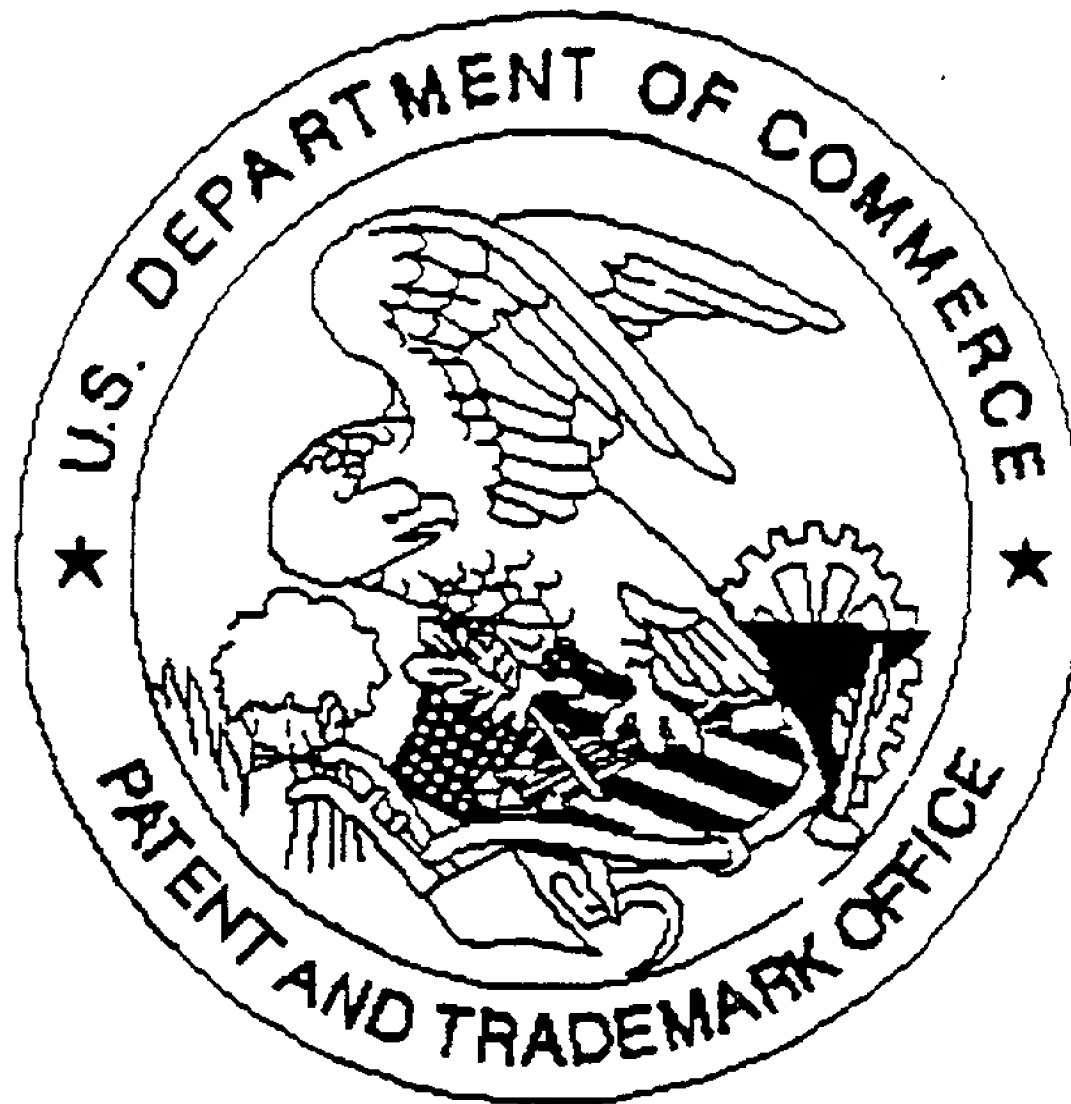
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☐ Scanned copy is best available.

There were Two sheet of drawings.